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STANDING STOCKS OF TROUT IN A SECTION OF CRYSTAL CREEK, PLUMAS COUNTY, 1992

by

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1992

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INTRODUCTION

Trout were caught in Crystal Creek (Figure 1) in August, 1992. Crystal Creek was sampled as part of a continuing program sponsored by the Department of Water Resources (DWR) which was designed to investigate the status of trout populations in tributaries in the Indian Creek watershed. Other tributaries sampled as part of this program include Red Clover Creek (Brown 1976, Brown 1990, Brown 1991), Hungry Creek (Brown, 1992a), Little Grizzly Creek (Brown 1992b), and Ward Creek (Keeney and Brown 1992). These creeks are sampled to provide information on trout life history and growth that will allow Indian Creek to be managed in a manner that will provide the best habitat for trout reproduction and survival. This is the first time Crystal Creek has been sampled as part of the Indian Creek studies.

METHODS

The standing stock of trout was estimated at one station in Crystal Creek in Plumas County. The length, average width, and average depth of the station were measured with a cloth tape (Appendix 1). Fish were captured with a battery-powered backpack electroshocker in a stream section blocked by seines. Captured fish were removed from the net-enclosed section on each pass. Standing stock estimates were developed using the multiple-pass method of Leslie and Davis (1939) with limits of confidence computed using a formula proposed by DeLury (1951).

Weights of rainbow trout (*Oncorhynchus mykiss*) were determined by displacement. Weights were measured for all fish caught. The fork length (FL) of each fish caught was measured to the nearest millimeter.

Scale samples were not taken because no trout measured exceeded 100 mm in length.

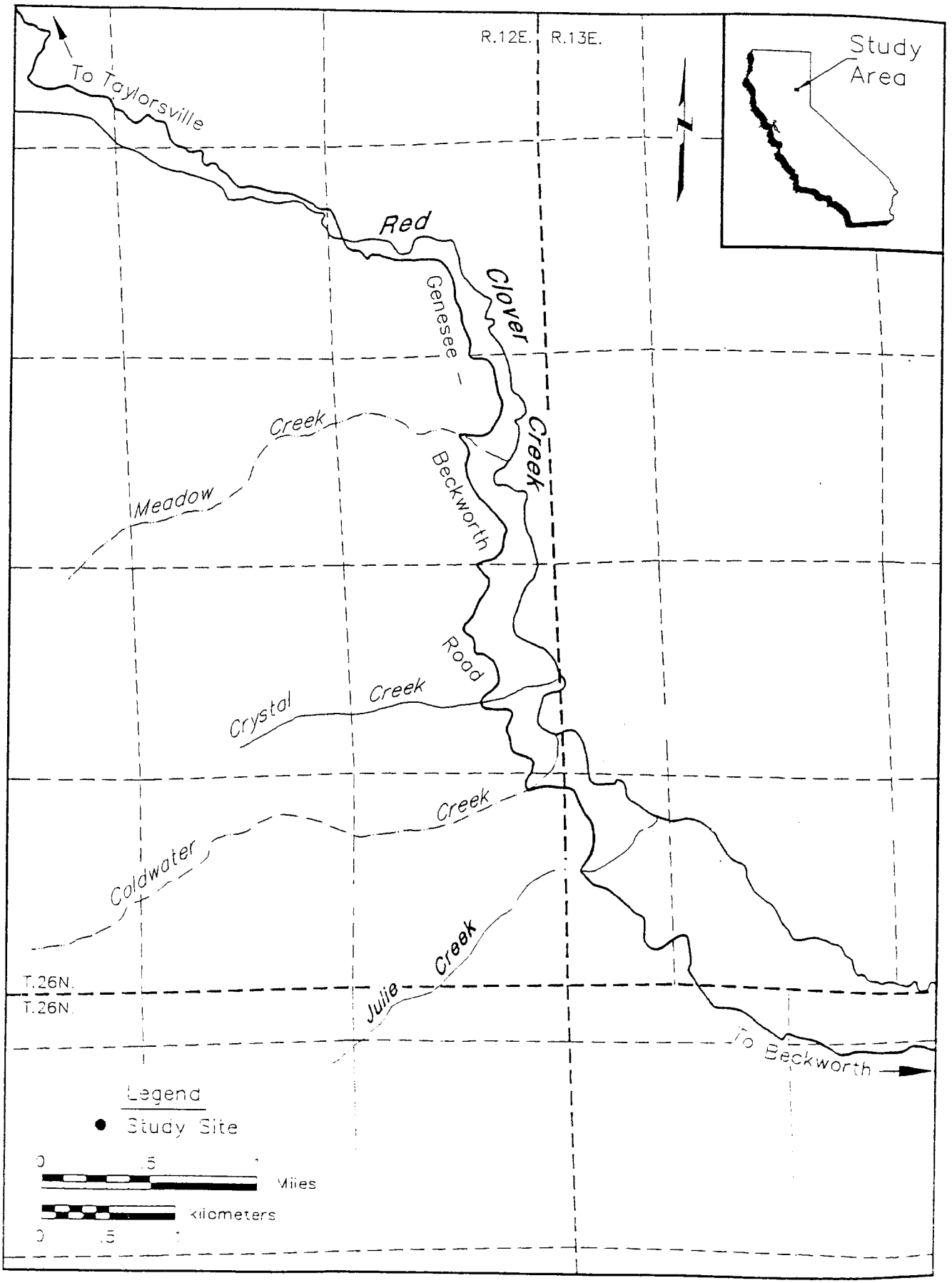

Figure 1. Station sampled to estimate biomass of trout in Crystal Creek, Plumas County, 1992.

Geometric mean functional regressions were used to describe length-weight relationships (Ricker 1975).

The standing crop of rainbow trout was calculated for the lone station.

The coefficient of condition and 95 percent confidence intervals were also calculated for rainbow trout.

RESULTS

Standing Stock

Rainbow trout was the only species caught in Crystal Creek. The biomass was 1.8 g/m^2 (Table 1). No catchable trout (≥127 mm FL) was caught.

TABLE 1. Estimate of Rainbow Trout Standing Crop in Crystal Creek, Plumas County, 1992.

Population Estimate	95% Confidence Interval	Biomass g/m^2	Estimate of Catchable Trout (≥127 mm FL)	Biomass of Catchable Trout g/m^2
12	12-13	1.8	0	0

Length and Weight

Age group 0+ rainbow trout represented 100 percent of the catch.

The relationship between length (L) and weight (W) of rainbow trout is:

$$\text{Log10 } W = -5.2 + 3.1 \text{ Log10 } L$$
$$r^2 = 0.92$$
$$N = 12 \text{ (Appendix 2)}$$

Coefficient of Condition

We calculated the coefficient of condition and 95 percent confidence limits for twelve rainbow trout. The coefficient of condition was 1.1244 and 95% confidence limits were 0.8316-1.4171 for 12 rainbow trout.

We have sampled six stations in five streams since 1990. All the streams held rainbow trout. Population estimates averaged 74 rainbow trout per station. Biomass averaged 3.6 g/m² (Table 2).

Table 2. Estimate of rainbow trout standing stocks and biomass in five tributaries to Indian Creek.

Stream	Number of stations	Average number of trout	Average biomass (g/m²)
Red Clover Creek	2	49	4.6
Hungry Creek	1	76	2.8
Little Grizzly Creek	1	131	4.6
Ward Creek	1	101	4.4
Crystal Creek	1	12	1.8
Average		74	3.6

LITERATURE CITED

Brown, C.J. 1976. Standing stocks of fishes in sections of Red Clover, Little Last Chance, Big Grizzly, Last Chance, and Squaw Queen Creeks, Plumas County, 1976. California Department of Fish and Game.

_____. 1990. Results of sampling fish in sections of Red Clover Creek, Plumas County, 1988. California Department of Fish and Game.

_____. 1991. Standing stocks of fishes in sections of Red Clover Creek, Plumas County, 1990. California Department of Fish and Game.

_____. 1992a. Standing stocks of fishes in sections of Hungry Creek, Plumas County, 1990. California Department of Fish and Game.

_____. 1992b. Standing stocks of fishes in sections of Little Grizzly Creek, Plumas County, 1990. California Department of Fish and Game.

DeLury, D.B. 1951. On the planning of experiments for the estimate of fish populations. J. Fish. Res. Bd. Canada. 8:281-307.

Keeny, S. and C.J. Brown. 1992. Standing stock of trout in a section of Ward Creek, Plumas County, 1990. California Department of Fish and Game.

Leslie, P.H., and D.H.S. Davis. 1939. An attempt to determine the absolute number of rats in a given area. J. Animal Ecology. 8:94-113.

Ricker, W.E. 1975. Computation and interpretation of biological statistics of fish populations. Fish. Res. Bd. Canada. Bull. 191, 382 p.

APPENDIX 1

PERMANENT FISH POPULATION STATION
CRYSTAL CREEK,
PLUMAS COUNTY, AUGUST 1992

Station 1 - Station 1 is located 0.8 stream kilometers above the confluence of Crystal Creek and Indian Creek (063 294 UTM). This station is heavily shaded by riparian vegetation. The substrate is predominantly gravel and sand. Most of this section is riffle (90%); however, a pool at the middle of the section made up 10% of the surface area. The station is 40.0 m long, has a surface area of 40.0 m^2 and a volume of 3.8 m^3 at 0.006 cms.

Appendix 2

LENGTH AND WEIGHT OF RAINBOW TROUT
CAUGHT IN CRYSTAL CREEK, 1992

FORK LENGTH	WEIGHT
63	3
65	3
66	3
75	4
75	5
85	6
86	7
86	8
87	7
90	7
90	11
92	9